IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Vero	Examiner:	Lindsey
Serial No.:	10/060,718	Art Unit:	3765
Filed:	01/30/2002		
For:	Unilayer Fabric with Reinforcing Parts		

Declaration of Dr. David M. Hall

I, David Michael Hall declare as follows:

1. I was Professor of Textile Engineering and Materials Engineering (joint appointment), College of Engineering, at Auburn University until my retirement August 31, 1995 when I became professor Emeritus of Textile Engineering. I have been a member of the faculty since 1965. My current address is 533 Jasmine Lane, Auburn, Alabama 36830. I received a Bachelor of Science in Textile Chemistry from Auburn University in 1958, a Master of Science in Textile Chemistry from Clemson University in 1962, and a Ph.D. in Polymer and Fiber Science from the Victoria University of Manchester England in 1964. I did post doctor studies at the Swiss Federal Institute (Zurich – 1965). I am a Registered Professional Engineer in Alabama. A current copy of my Curriculum Vitae is attached and sets forth my pervious experience and my educational experience.

2. During the course of my career I have received numerous honors and awards. For instance, I was elected to the Tau Beta Pi under the Eminent Engineer status in 1970; and to Phi Kappa Phi in 1976. I am also a member of Pi Tau Sigma (Mechanical

Engineering honorary), Phi Psi (textile honorary), I was elected a Chartered Textile Technologist and Fellow of the Textile Institute (FTI) in 1974; I have been a Chartered Colorist and Fellow of the Society of Dyers and colorist since 1980; and I was the recipient of the R&D 100 award for inventions in 1989.

3. Over the past 35 years, I have published widely in the area of textile technology, specifically in the use of Scanning Electron Microscopy and Energy Dispersive Analysis for problem solving applications. Among my publications are five textbooks on textile preparation, testing and fiber identification, and textile sizing. I have written several chapters in other books. I have also published over 55 research papers and numerous other "state-of-the-art" type papers. Further, I have presented over 75 technical/research papers to various professional organizations and gatherings in the area of textile science and technology. I am a reviewer for several peer journals such as *Textile Research Journal* and *Industrial and Engineering Chemistry.*

4. I hold 30 issued US patents (and one pending) all in the area of textile science or applied textile technology. The patents range from a family of ignition resistant carbonaceous fibers that have application as light weight insulation, fire blocking, IR and EM shielding, asbestos replacement, anti slosh agents in fuel tanks among others. He has also developed non salt methods for dyeing textiles, garment de-colorization using ozone, superior anti friction lubricants, a novel process to recover rubber from automobile tires, the synthesis of non-polluting and biodegradable dyes among others. I also have substantial experience in forensic textiles. I have performed analyses and or tests as a consultant for over 200 textile related firms, many of which

involve standard testing methods as well as problems and applications in dyeing and finishing.

5. I am a retired reserve Colonel with 31 years experience in the U.S. Army. In this capacity I spent most of my military career as a research and development coordinator for the U.S. Army Research and Development Command principally dealing with their textile related application.

6. I have read the present application, especially, Example I and U.S. Patent No. 6,155,084 to Andrews et al.

Knitted fabrics are broadly grouped into two main categories, warp knitted fabrics and weft knitted fabrics. The difference between the two knitted structures is that warp knitted fabrics are formed by machines such as those manufactured by Shima Seiki wherein the knit yarns are fed and continuously interloped in the lengthwise direction of the fabric. Warp knitting requires two sets of needles and a large number of parallel yarns are mounted on the knitting machine. The fabric is made by building the loops on top of each other. In warp kit fabrics the yarn forms vertical loops in one course and then moves diagonally to the next course to knit the next course. Andrews et al describes a fabric having two sets of needles. The band 202 in Andrews et al indicates the double set of needles wherein all needles move together in one motion. Warp knits do not form chain stitching and are not unilayer. The back side inherently has slightly angled horizontal floats.

The example in the present application describes a single knit weft knit. The use of a single needle produces the chain stitch which is also known as the plain stitch on the jersey stitch.

There are four principal stitches used to make kit fabrics: (1) the plain stitch, (2) the purl stitch, (3) the miss stitch, and (4) the tuck stitch.

The present application describes a knitting process in which yarn is supplied to a single needle which controls the wale and course numbers. A single needle controls loop length so that it is possible to predict at what positions in the fabric positions of the yarn respectively appear. The procedure differs from knitting with two sets of multiple needles in which yarn supply is separate and all needles move in one motion as in warp knit.

Conclusion:

The procedure described in the present application utilizing a single needle for controlling sale and course results in a weft knit fabric which is controllable by a program and forms chain stitches or plain knits which are in a single layer. The results of weft knitting are not predictable from warp knitting as disclosed in Andrews et al.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine of imprisonment, or both, under Section 1001 of title

18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

David M. Hall, PH.D., PE, FTI, FSDC